CHAPTER 8
SAFETY ELEMENT

The Safety Element is a guide for the City Council, government agencies, and individuals to identify and understand potential hazards confronting Costa Mesa. The Element examines natural and man-made hazards that could endanger the public safety and welfare. These concerns are subsequently incorporated into goals, objectives, policies and implementation measures to reduce the impacts of hazards.

8.1 PURPOSE

The Safety Element helps protect the community from natural and man-made hazards. Natural hazards include flooding, earthquakes, ground rupture and liquefaction. Man-made hazards can result from hazardous and toxic materials, fires, and crime. Ultimately, the Safety Element aims at reducing death, injuries, property damage, and economic and social dislocation resulting from these hazards.

The Safety Element will focus on the following five topics:

- Geology;
- Hydrology/Drainage;
- Fire Protection;
- Police Protection; and
- Hazardous Materials.

The Safety Element follows guidelines in the State Government Code, Sections 65302(g) and 65302.5, as well as Public Resources Code Sections 4102, 4125, 4128.5 and 2699.

8.2 RELATIONSHIP TO OTHER GENERAL PLAN ELEMENTS

The Safety Element is one of ten elements included in the Costa Mesa 2000 General Plan. The policies of the Safety Element are directly related to the policies in the Land Use, Urban Design and Housing elements. The goals,

objectives and policies of the Safety Element shall be consistent with all other elements of the Costa Mesa 2000 General Plan.

8.3 SUMMARY OF EXISTING CONDITIONS

GEOLOGY

GEOLOGIC STRUCTURE

Costa Mesa lies adjacent to the Downey and Tustin portion of the Coastal Plain, where sedimentary and volcanic rocks in the subsurface attain great thickness. These deposits are composed mainly of volcanic, marine and nonmarine sedimentary rocks overlying a basement complex of granitic and metamorphic rock. The plain is immediately underlain by a thick sequence of alluvial sediments, which overlie the older sedimentary and volcanic rocks.

The main development of Costa Mesa is primarily on an uplifted mesa (Newport Mesa) bounded on the west, south, and east by steep cliffs (refer to Exhibit SAF-1, *Geologic Map*). Newport Mesa slopes gently northward from an elevation of 80 to 110 feet above sea level at the southern crest of the mesa to less than 40 feet above sea level at the northern boundary of the City. Approximately 80 percent of the City is located on this mesa.

Newport Mesa is the most southerly of a series of discontinuous low hills and plains that extend along the Newport-Inglewood structural zone from the Santa Monica Mountains southeast to Newport Beach. These topographic features are inferred from both the physiographic and stratigraphic evidence to be essentially contemporaneous segments of the Sangamon Age (120,000 years Before Present) deformed lower terrace of the Palos Verdes Hills.

SOILS

Soils within Costa Mesa are variable, ranging from a predominance of clay with some silty sand in the northern half of the City to a predominance of silty sand with some sand and clay in the southern half (refer to Exhibit SAF-2, *Soil Types*). These generalized units were derived from a more detailed soils map contained in the soil survey of Orange County.

MINERAL RESOURCES

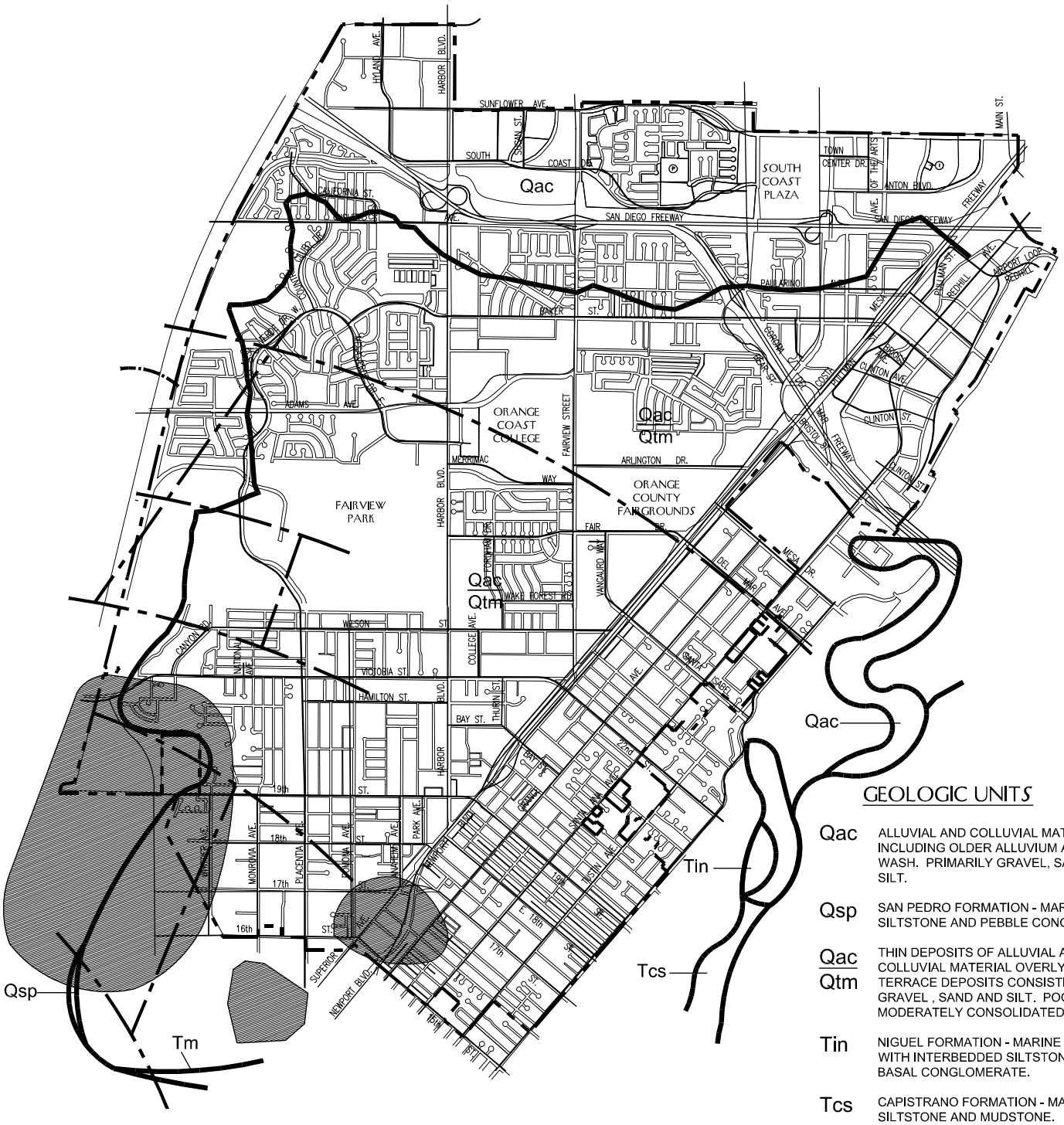
Oil

Portions of Costa Mesa overlay the West Newport Oil Field, which is south of 17th Street between Pomona and Westminster Avenues, and the West Newport Oil Field, which is west of Whittier Avenue, south of Victoria Street (refer to Exhibit SAF-1, *Geologic Map*).

Currently the only active oil wells in Costa Mesa operate in the West Newport Field west of Whittier Avenue between 17th and 19th Streets.[1] These wells produce a relatively low quality crude oil and remained in operation through the mid-1990s.

[1] Per telephone conversation with Floyd Leeson at the California Division of Oil and Gas on May 8, 2000.

GEOLOGICAL MAP



GEOLOGIC UNITS

Qac	ALLUVIAL AND COLLUVIAL MATERIAL, INCLUDING OLDER ALLUVIUM AND SLOPE WASH. PRIMARILY GRAVEL, SAND AND SILT.
Qsp	SAN PEDRO FORMATION - MARINE SILTSTONE AND PEBBLE CONGLOMERATE.
Qac / Qtm	THIN DEPOSITS OF ALLUVIAL AND COLLUVIAL MATERIAL OVERLYING MARINE TERRACE DEPOSITS CONSISTING OF GRAVEL , SAND AND SILT. POORLY TO MODERATELY CONSOLIDATED.
Tin	NIGUEL FORMATION - MARINE SANDSTONE WITH INTERBEDDED SILTSTONE AND BASAL CONGLOMERATE.
Tcs	CAPISTRANO FORMATION - MARINE SILTSTONE AND MUDSTONE.
Tm	MONTEREY FORMATION - MARINE SHALE, SILTSTONE, SANDSTONE AND LIMESTONE.
	LOCATION OF BURRIED TRACES OF THE NEWPORT - INGLEWOOD STRUCTURAL ZONE.
	LOCATION OF OIL DEPOSITS.

SCALE: 1"=4500'

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EXHIBIT SAF-1

Peat Deposits

Peat deposits are located adjacent to the Santa Ana River and in the vicinity of Upper Newport Bay (refer to Exhibit SAF-2, *Soil Types*). The size of the deposits in Costa Mesa is not sufficient to justify extraction. However, peat does provide an unstable base for construction and must be removed prior to development.

SEISMICITY

Earthquake Faults

Four major faults or zones present a seismic hazard for Costa Mesa: Newport-Inglewood structural zone; Whittier fault zone; San Andreas fault zone; and San Jacinto fault zone. Other faults with lesser seismic hazard include the El Modeno, Norwalk, Palos Verdes, 4-S Ranch and Aliso faults (refer to Exhibit SAF-3*, Regional Fault Map*).

The intensity of earthquakes is measured, or expressed, in terms of two scales. One, the Richter Scale, measures the strength of an earthquake, or the strain energy released, as determined by seismographic observations. The second, the Mercalli Intensity Scale, describes the intensity in terms of observable impacts. Both measurement systems are referenced in the following discussions.

Newport-Inglewood Structural Zone. The Newport-Inglewood structural zone consists of northwesterly trending folded hills and echelon faults extending over 40 miles from the Santa Monica Mountains to Newport Beach where it projects offshore for an unknown distance. The zone is seismically active with numerous recorded earthquakes. The largest and most completely documented was the Long Beach earthquake of 1933 (6.3M), which resulted in strong shaking in Costa Mesa as well as in other portions of southern California.

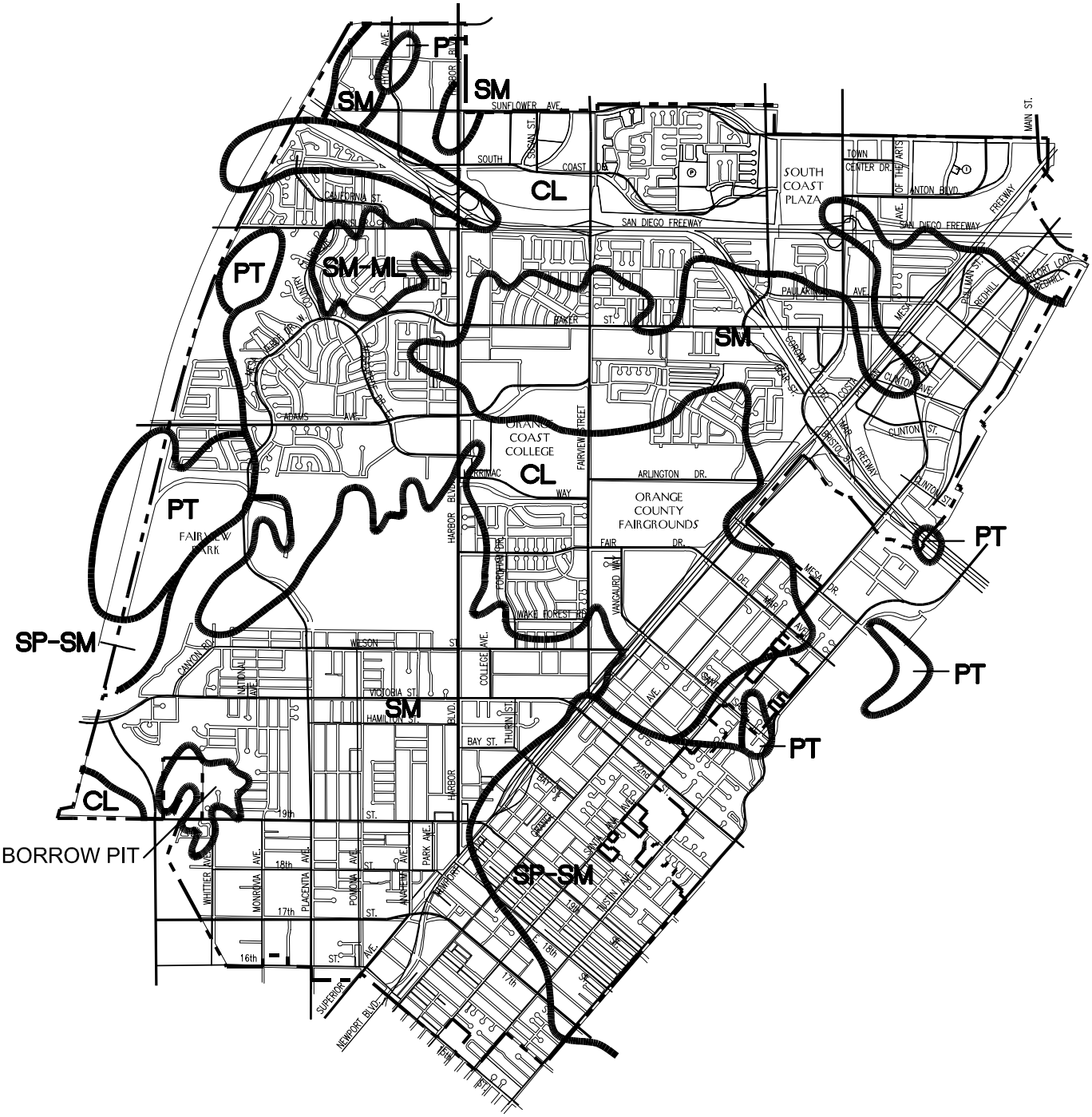
The Newport-Inglewood structural zone is approximately 3.5 miles wide within Costa Mesa. Five northwest trending traces (refer to Exhibit SAF-3, *Regional Fault Map*) have been projected through the City based primarily on subsurface data. The main trace, classified on the basis of seismic activity, lies 0.3 miles south of the City limits.

Whittier Fault Zone. The Whittier fault extends over 20 miles from the Whittier Narrows near Whittier, southeasterly to the Santa Ana River where it merges with the southeasterly trending Elsinore fault. Collectively, these two faults combined with smaller faults are known as the Whittier-Elsinore fault zone. The nearest approach to the City of Costa Mesa is approximately 15 miles to the northeast.

No major or moderate size earthquakes have occurred along the Whittier fault in historic time; however, microseismic data show clustering of events along its trace demonstrating that it is seismically active. On October 1, 1987, an earthquake seriously impacted the Whittier area, but did not occur on the Whittier Fault. The 5.9 magnitude earthquake occurred along a previously unidentified fault located in Los Angeles. The fault has since been named the Elysian Hills Fault. On October 4, 1987, a 5.3 magnitude aftershock again shook Whittier.

On February 19, 1988, a second major aftershock (5.0 magnitude) shook Whittier.

SOIL TYPES



SOIL UNITS

PT	Peat
CL	Clay
SM-ML	Silty sand to sandy silt
SP-SM	Sand to silty sand
SM	Silty sand

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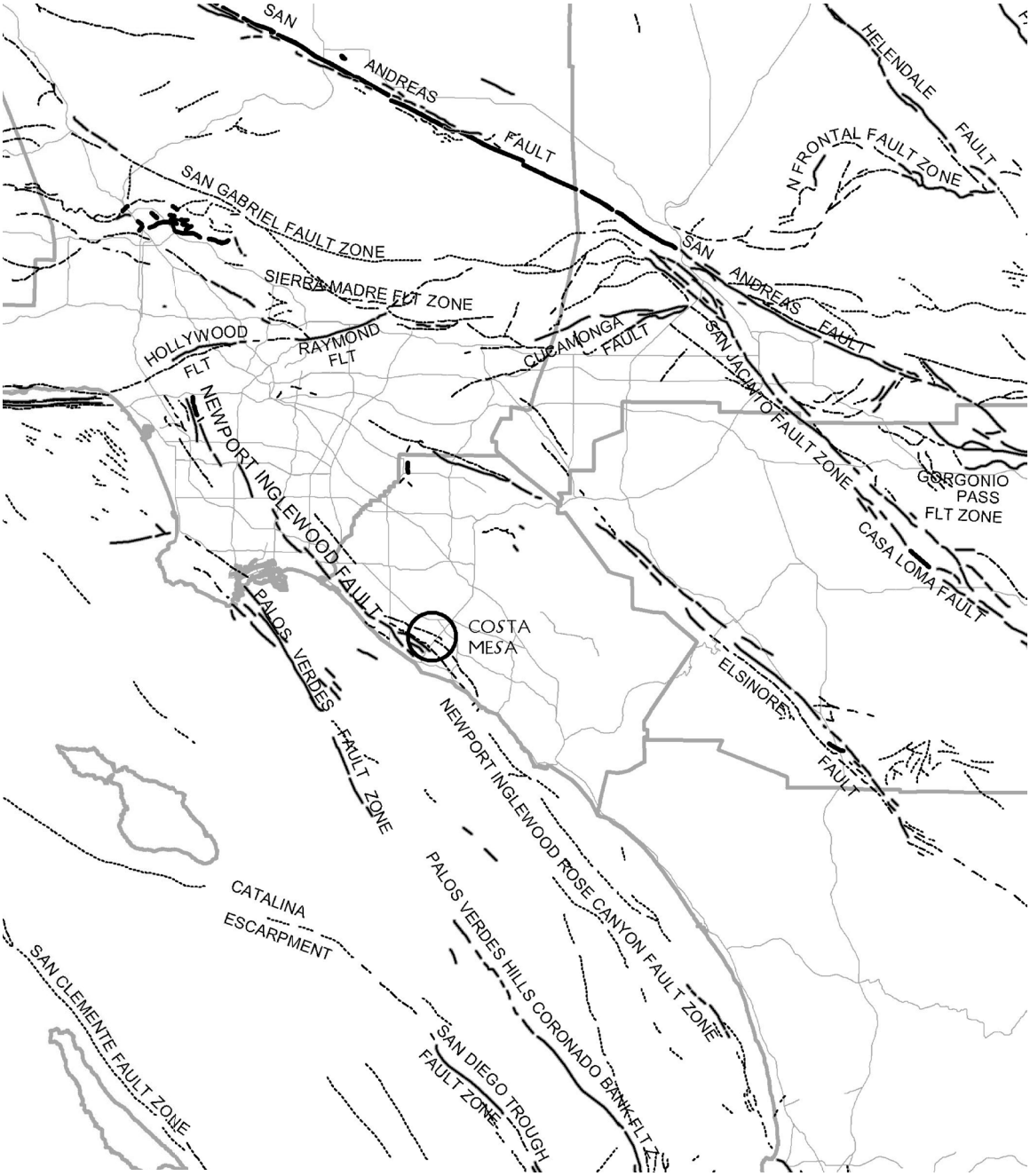
EXHIBIT SAF-2

REGIONAL FAULT MAP



Costa Mesa City Boundary
Roads
County Boundary

Quartinary fault (age undifferentiated) .Most faults of this category show displacement sometime during the past 1.6 million years.

Late Quarternary fault displacement (during the last 700,000 years).

Holocene fault displacement (during past 10,000 years).

Faults along which historic (last 200 years) displacement has occured and is associated with one or more of the following:

a) a recorded earthquake with surface rupture.
b) fault creep slippage - slow ground displacement usually without accompanying earthquakes.
c) displaced survey lines.

N.T.S.

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Source: Department of Conservation; Division of Mines and Geology; Fault Activity Map of California and Adjacent Areas with Locations and Ages of Recent Volcanic Eruptions;1994. Compilation and Interpretation by: Charles W. Jennings; with assistance from: George J.Saucedo. Most of the data shown on this map were compiled from 1989 to 1992. A Preliminary version was released in 1992. Additional data were added and revisions made in 1993 and 1994; this map supersedes the 1992 version. This compilation was completed before the preliminary Earthquake Fault Zones Maps of 1994 were completed so there may be minor differences.

Caution: This fault map and accompanying report are for use as a guide only and should not be used to replace site specific evaluation.

EXHIBIT SAF-3

San Andreas Fault Zone. The San Andreas is the best known of all California faults due mainly to its known historic seismic activity and destructive capabilities. The center section of the fault ruptured the ground surface in the 1857 Fort Tejon earthquake (8.3± M estimated), causing considerable damage from ground shaking over thousands of square miles. Its closest approach to Costa Mesa is 48 miles, lying on the northeastern flank of the San Bernardino Mountains.

San Jacinto Fault Zone. The San Jacinto fault zone extends over 180 miles from its junction with the San Andreas fault southeast of Palmdale to the Colorado River delta. The closest approach of this fault to Costa Mesa is 44 miles. Several damaging historic events have occurred along the San Jacinto fault, the most notable being the Imperial County earthquake of 1940, which generated surface faulting. Although the San Jacinto fault zone is slightly closer to Costa Mesa, the potential levels of ground shaking from the San Andreas fault are higher because of its larger maximum credible earthquake.

Seismic Hazard Map Act

The Seismic Hazard Map Act was passed by the Legislature in 1990 following the Loma Prieta earthquake in an effort to further identify and mitigate seismic hazards associated with shaking, liquefaction and slope instability throughout the State of California. Generally, the zone includes the same portions of the City that are also included in the Federal Flood Hazard Zone.

GROUND SHAKING

The effects of seismically induced ground shaking are probably the most critical potential seismic hazards to the City of Costa Mesa. The severity of ground shaking at any particular site depends primarily upon the magnitude of the earthquake, the location of the causative fault with respect to the site, and soil and/or rock conditions at the site.

The effects of ground shaking in Costa Mesa will vary considerably depending on the distance of the seismic source to the City and the duration of strong vibratory motion. Ground shaking from distant seismic events (greater than 40 miles), will be of a different nature than events within 10 miles of Costa Mesa. For more distant, large (greater than 7.5M) events such as those that occur on the San Andreas fault, the ground shaking will reflect a predominance of long period waves. This will have minimal effects upon structures less than three stories in height, but will affect flexible structures (typically high-rise buildings, greater than three stories), especially if the natural period of the building should coincide with that of the long period earthquake waves. The resultant amplifications of motions could result in serious damage to high-rise structures. Short period waves, however, are generally very destructive near the epicenter of moderate- and large-magnitude seismic events, causing severe damage predominately to low-rise rigid structures (less than three stories) not specifically designed to resist them.

The duration of strong ground motion is a function of magnitude and distance from the causative fault. It is probably the single most important factor in producing excessive damage to structures. Long duration, reasonably high acceleration, and considerable amplitudes, as would occur from a maximum seismic event on the Newport-Inglewood structural zone, are the combination which would do the most damage to buildings. A distant maximum seismic event on the San Andreas fault would produce less intensity of shaking; however, duration of strong ground motion

would be longer resulting in a high potential for damage to high-rise flexible structures.

GROUND FAILURE

Seismically induced ground failure as discussed in this section includes liquefaction, differential compaction, ground lurching, ground cracking, and earthquake induced slope failures.

Liquefaction

Liquefaction of surface or subsurface materials is the result of strong ground shaking of water-saturated, loose to moderately dense sand and silty sand. It is defined as the transformation of a granular material from a solid state into a liquefied state as a consequence of increased pore water pressure that occurs during an earthquake. Liquefaction can result in shifting of foundations, settling of roadways, and rupture of underground pipelines and cables. Buildings and other objects on the ground surface can settle, tilt, and collapse as the foundations beneath them lose support, and lightweight buried structures may float to the surface. Four types of general failure commonly result from liquefaction: lateral spreading, flow failure, ground oscillation and loss of bearing strength.

Even though Costa Mesa has been subjected to strong ground shaking in the past (e.g., the 1933 Long Beach earthquake), available historic records fail to confirm an instance of liquefaction. However, instances of liquefaction have been reported in the nearby cities of Huntington Beach and Newport Beach. The potential exists for liquefaction in localized sections within the northwest and western portions of the City (refer to Exhibit SAF-4, *Liquefaction*).

Differential Compaction or Settlement

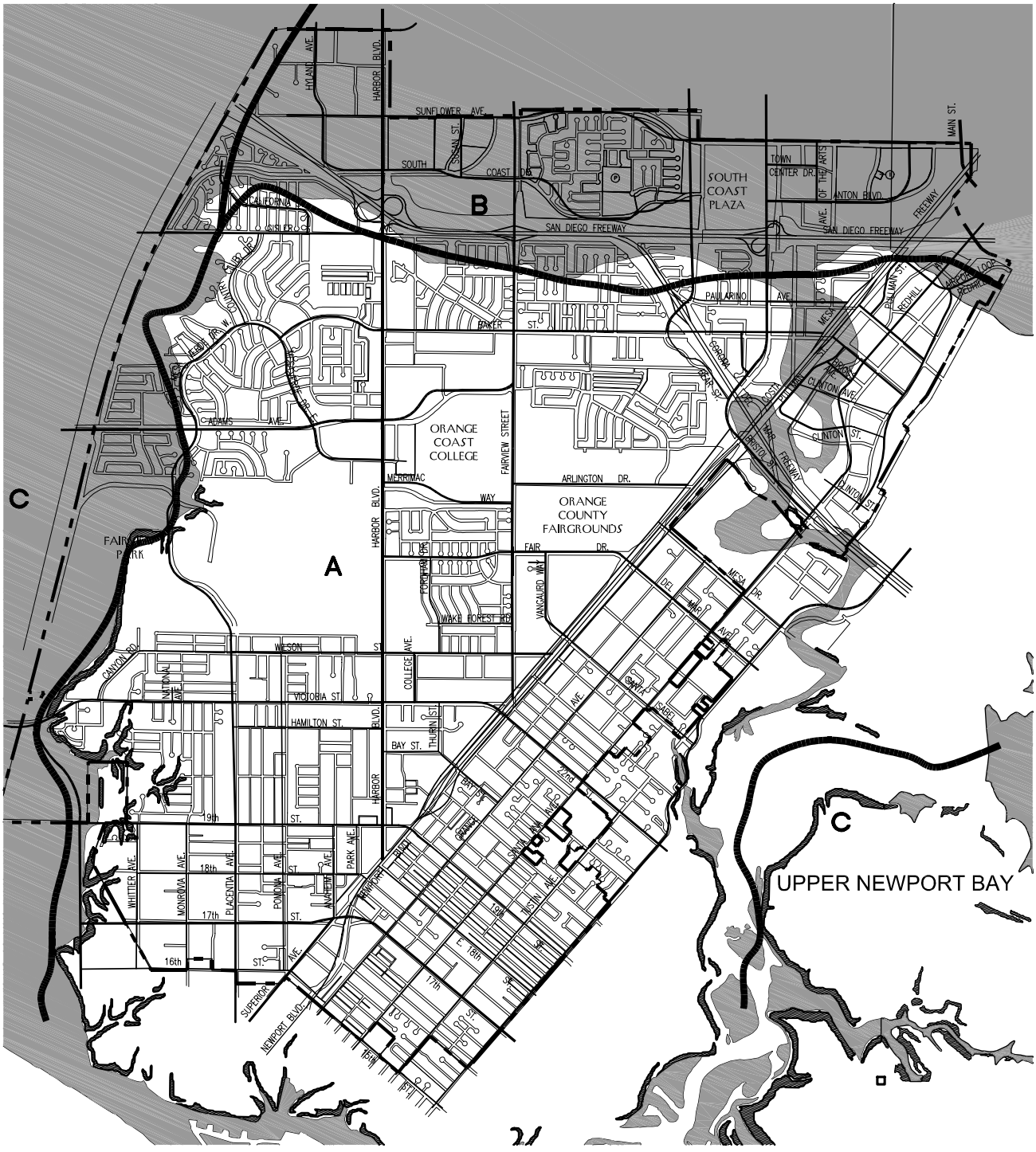
Differential ground settlement resulting from earthquake ground shaking is potentially damaging to structures and buried utilities and services. Differential settlement may occur in cohesionless sediments where differences in densities in adjacent materials lead to different degrees of compaction during ground shaking. In the case of saturated cohesionless sediments, post earthquake settlement may occur when excess pore-water pressures generated by the earthquake dissipate. For soft saturated cohesive soils such as the known peat deposits within Costa Mesa, post earthquake differential settlement may also occur (refer to Exhibit SAF-2, *Soil Types*). Whereas differential settlement is a potential hazard in Costa Mesa, the significance of the hazard at any particular site may only be determined by soils investigations.

Ground Cracking, Ground Lurching, and Lateral Spreading

Both ground lurching and cracking are secondary features resulting from strong to moderately strong ground shaking and may be associated with liquefaction. Ground cracking usually occurs in near-surface materials, reflecting differential compaction or liquefaction of underlying materials. The potential for ground cracking exists especially in those areas of the City which have a moderate to high potential for liquefaction and in regions on known peat deposits.

Ground lurching results when soft, water-saturated surface soils are thrown into undulatory motion. Areas within Costa Mesa occur in those regions indicated on Exhibit SAF-4, *Liquefaction*, that have a high potential for liquefaction.

LIQUEFACTION



LIQUEFACTION POTENTIAL

A	Low
B	Moderate
C	High

SCALE: 1"=4500'

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EXHIBIT SAF-4

Lateral spreading (a form of landsliding) is referred to as limited displacement ground failure, often associated with liquefaction. Compact surface materials may slide on a liquefied, or low shear strength layer at shallow depth, moving laterally several feet down slopes of less than two degrees. Lack of adequate subsurface data prohibits delineating areas in Costa Mesa prone to shallow landsliding. Such a hazard may be present where conditions conducive to shallow liquefaction exist or where soils exist along the bluffs adjacent to the Santa Ana River or Newport Bay.

Slope Stability

Seismically related slope stability problems include landslides, rockfalls, mudslides, and avalanches. Since the City is primarily located on flat to gently sloping terrain (generally less than one percent), the potential for these hazards is remote. However, the potential exists for earth movements during strong ground shaking along the bluffs that surround the southern half of the City. In recognition of this potential, the City's zoning ordinance requires a 10-foot building setback from the bluff crest. Buildings may locate closer with the approval of a Conditional Use Permit provided that it is demonstrated that the structure does not endanger the stability of the slope, interfere with fire access or detract from the visual integrity of the slopes.

SURFACE FAULTING

Surface faulting, rupture of the ground surface along a causative fault trace, is associated with the primary movement that produced the seismic event and should not be confused with secondary ground cracking which is simply a result of shaking and may occur at some distance from the causative fault. The likelihood of surface rupture on a given fault can be determined principally by studying the seismic history of the fault and reviewing geologic evidence which suggests historic or prehistoric surface rupture. Many past studies have shown that future surface faulting is most likely to occur where the trace ruptured last, especially if there is evidence of repeated and significant displacement on the trace.

The only active fault zone to occur within the City limits is the Newport-Inglewood structural zone. Although the Newport-Inglewood structural zone is seismically active, surface faulting does not appear to be a significant potential hazard.

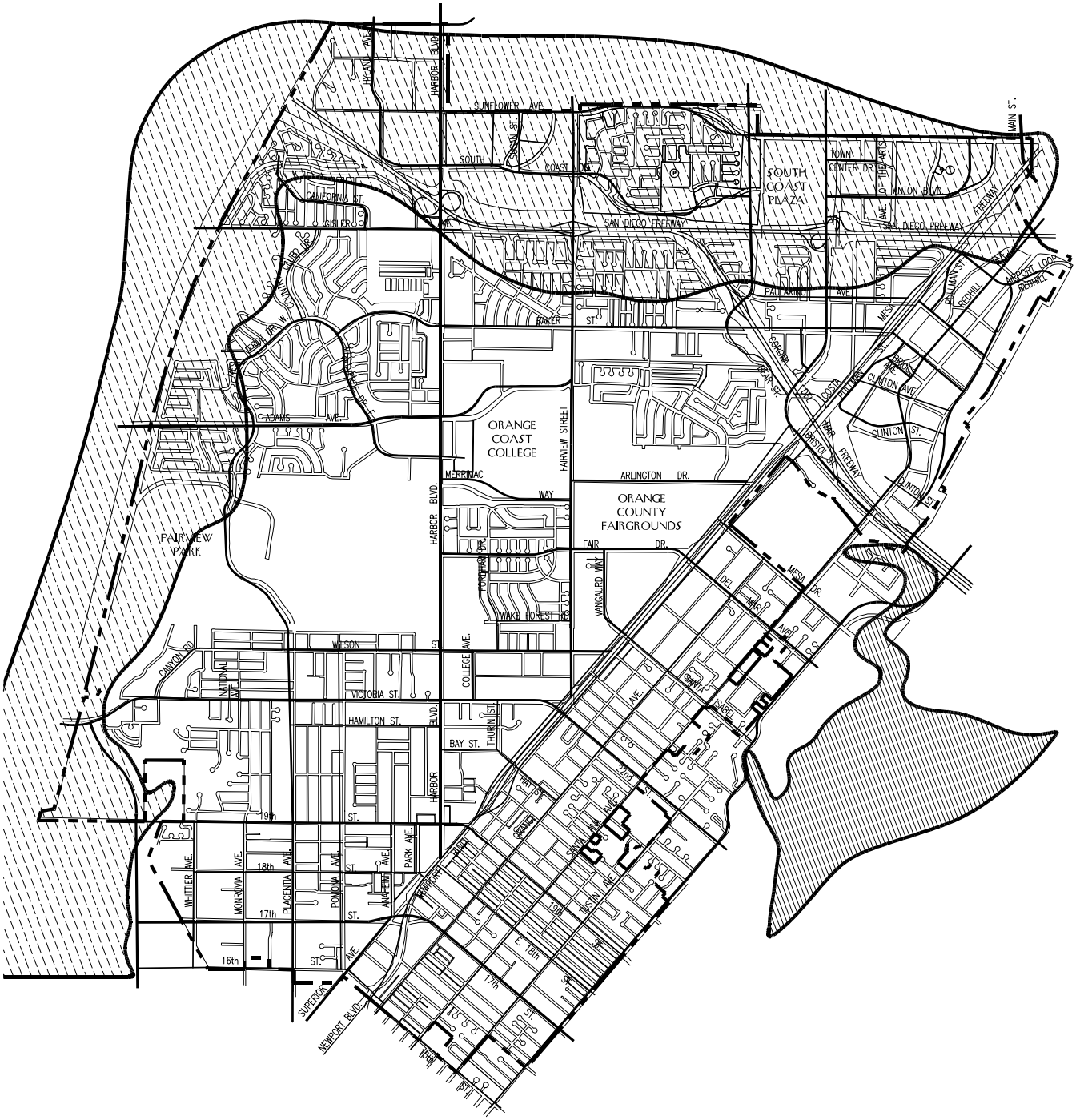
SEISMICALLY INDUCED WATER WAVES

Seismically induced water waves include tsunamis, seiches, and waves generated by failure of retaining structures. Tsunamis are generated by earthquake-induced subsea dislocations or landslides which cause large volumes of water to move in the form of ocean waves. Coastline configuration and tidal influx may cause local amplifying effects. A seiche is a low amplitude wave generated in a restricted body of water due to earthquake motions. Refer to Exhibit SAF-5, *Flooding and Seismically Induced Waves*.

Tsunamis

Costa Mesa is three-quarters of a mile inland from the ocean at elevations between approximately 30 to 100 feet above sea level. The southern portion of the City resides on 100-foot bluffs overlooking the City of Newport Beach. The potential for tsunami effects within most of the City is negligible. However, within areas of the Santa Ana River Channel, where low elevations occur, the potential exists for tsunami effects.

FLOODING AND SEISMICALLY INDUCED WAVES



LEGEND

Area of potential flooding from failure of Prado, Santiago or Villa Park Dams

Area of very-low potential flooding from Seiche or Tsunami

SCALE: 1"=4500'

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EXHIBIT SAF-5

Seiches

The absence of any large bodies of water within Costa Mesa and the location of high bluffs adjacent to Newport Bay preclude the possibility of damage from seiche effects. This could change should construction of lakes or large reservoirs take place.

HYDROLOGY/DRAINAGE

DRAINAGE PATTERNS

The City of Costa Mesa is unique in its drainage pattern because of the slope and topography of the land. In two places in the City, water may actually drain in four different directions. The advantages of these conditions relate to the ability to install short storm drain systems due to the small drainage areas and means that uncontrolled runoff is not as hazardous because of the lower water concentrations. Generally speaking, Costa Mesa has sufficient natural slope to assist storm runoff.

Runoff that is generated outside of the City, which is transported through or adjacent to the City, creates a different type of drainage problem. Channels on the north, east and west sides of the City are primarily dominated by runoff that originates from neighboring jurisdictions, but these channels are also required to dispose of runoff generated in the City of Costa Mesa.

FLOOD HAZARDS

The greatest potential flood hazard in the City is from the Santa Ana River, followed by the Greenville-Banning Channel and the Santa Ana-Delhi Channel. Costa Mesa is located immediately adjacent to the Santa Ana River, the largest river system in Southern California. The basin area of this system encompasses a total of approximately 3,200 square miles, including portions of San Bernardino, Riverside and Orange Counties. In the recent past, the current channel capacity for the Santa Ana River upstream of Costa Mesa was not sufficient to carry the 100-year nor the 500-year frequency floods. Under such flood conditions, excess flood flow is expected to breech the levee in the City of Santa Ana causing widespread flooding of both Santa Ana and Costa Mesa due to ponding of water directly upstream of the San Diego Freeway. However, the Santa Ana River Mainstem project is designed to provide flood protection to Orange, Riverside and San Bernardino Counties. The improvements cover 75 miles from the headwater of the Santa Ana River east of the City of San Bernardino to the mouth of the river at the Pacific Ocean between the Cities of Newport Beach and Huntington Beach. The Mainstem Project will increase flood protection to more than 3.35 million people within the three Counties. The project includes seven independent features: Seven Oaks Dam, Mill Creek Levee, San Timoteo Creek, Oak Street Drain, Prado Dam, Santiago Creek and the lower Santa Ana River.

Prado Dam is located northeast of the City in Riverside County. The dam was designed in the 1930s, but has recently increased its functioning capability due to the Seven Oaks Dam, which was completed in November 1999 and is located approximately 40 miles upstream on the Santa Ana River. During a flood, Seven Oaks Dam will store water destined for Prado Dam for as long as the reservoir pool at Prado Dam is rising. When the flood threat at Prado Dam has passed, Seven Oaks Dam will begin to release its stored flood water at a rate that does not exceed the downstream channel capacity. Working in tandem, the Prado and Seven Oaks Dams provide increased flood protection to Orange County.

In April 1996, the Federal Emergency Management Agency (FEMA) National Flood Insurance Program's Flood Insurance Map (FIRM) classified areas with the potential for flooding along the Santa Ana River as Zone A99. The Zone A99 designation identifies areas that are protected by a Federal flood protection system constructed as having a one percent chance of being equaled or exceeded in any given year (base flood) with no base flood elevations (BFEs) determined. This designation was the direct result of construction of the Santa Ana Mainstem flood control project, which included two critical features: channel and bridge widening; channelization of the Lower Santa Ana River Channel Reaches 1 and 4; and construction of the Seven Oaks Dam.

As of June 14, 2000, the FIRM maps for Costa Mesa were revised by FEMA, removing the Zone A99 designation within the Costa Mesa area. These revisions are reflected on FIRM panels 06059C0037 F, 06056C0046 F, 06056C0054 F and 06056C0038 F. As a result of the revisions to the FIRM maps, the potential for 100-year floods in Costa Mesa lies predominately within the flood channels (refer to Exhibit SAF-6, *Flood Hazard Area*).

DAM INUNDATION

The City of Costa Mesa, along with the cities of Anaheim, Buena Park, Cerritos, Cypress, Fountain Valley, Fullerton, Garden Grove, Huntington Beach, Irvine, Long Beach, Newport Beach, Orange, Placentia, Santa Ana, Seal Beach, Stanton, Westminster, and Yorba Linda are located within the dam inundation area of Prado Dam. Only a small portion of the City of Costa Mesa is located within the dam inundation area, and that portion is limited to the area closest to Newport Bay. No other areas of the City are located within the dam inundation area of Prado Dam. The Prado Dam has been designed to protect against a 100-year flood (or a one percent chance event). During any 100-year period, a 39 percent risk[2] exists that one or more floods will occur that exceed the design level.[3]

DRAINAGE FACILITIES

Existing and proposed local drainage facilities are designed to provide a measure of control for storm water generated within Costa Mesa for a ten-year storm. As such, the level of protection decreases as the recurrence interval increases since the facilities are capable of handling of 25-year or 100-year storm runoff. Although the proposed improvements to the City's drainage facilities will reduce the damage from these higher than design storms, it is impractical to design the local drainage system for greater than a ten-year storm. Because of this, minor flooding will occur when local flows exceed the system's capacity or if inlets plug with trash and debris.

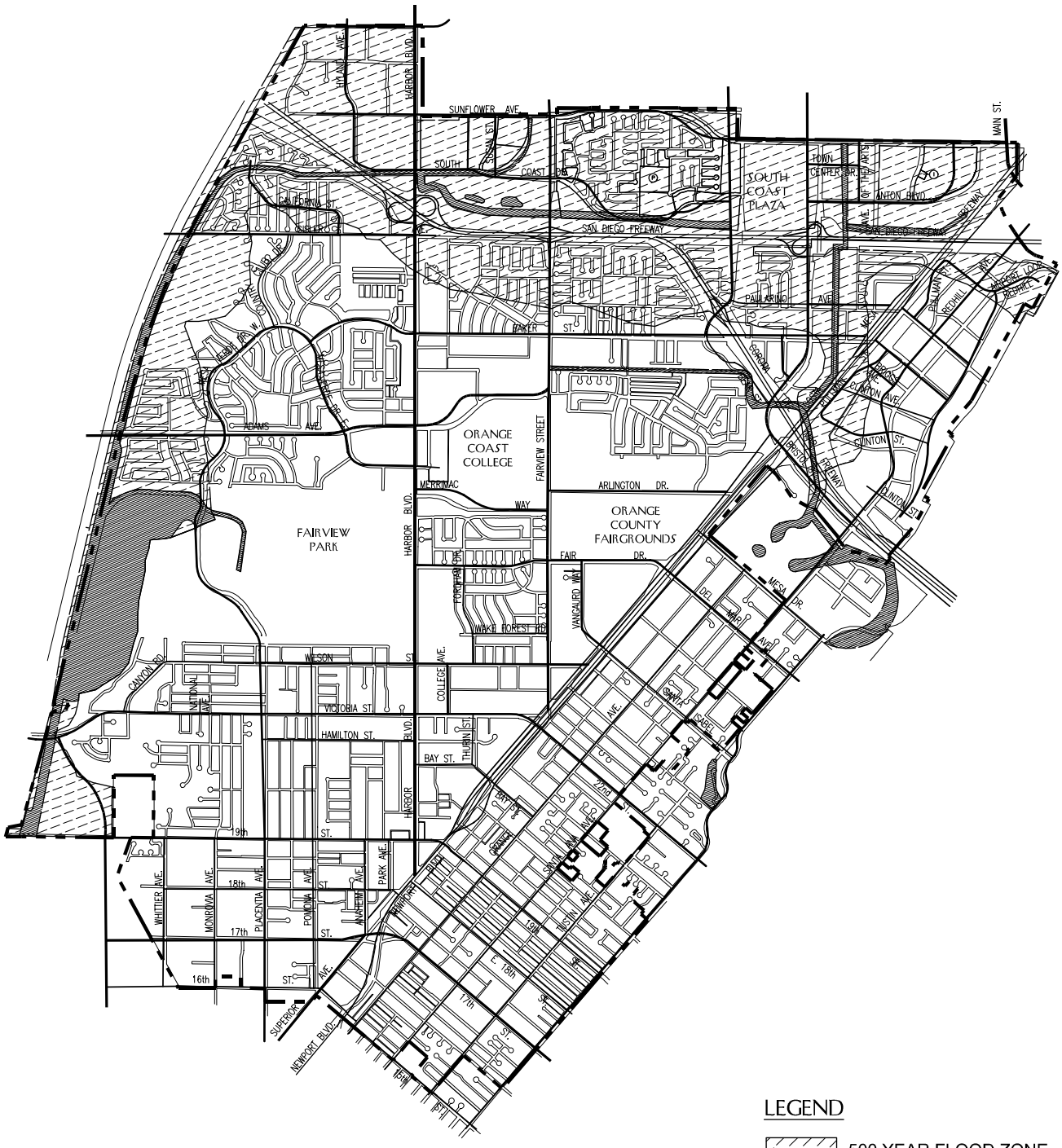
DRAINAGE/FLOOD HAZARD MANAGEMENT

Local drainage and runoff problems can be controlled through proper anticipation of potential flood problems, analysis of existing and future system deficiencies and construction of appropriate flood control facilities. The Master Drainage Plan (refer to Exhibit SAF-7, *Master Plan of Drainage*) was prepared for the City in December

[2] Risk expresses the likelihood (percent chance) that one or more floods may exceed the design flow within a specified number of years.

[3] Source: Table 7-41, Flood Risk Analysis, *Santa Ana River Project – Phase II GDM, Volume 7, Hydrology*.

FLOOD HAZARD AREA



SOURCE: FLOOD INSURANCE RATE MAP, PANEL 37 OF 81, MAP# 06059C0037 F, JUN 14, 2000
PANEL 38 OF 81, MAP # 06059C0038 F, JUN 14, 2000
PANEL 46 OF 81, MAP # 06059C0046 F, JUN 14, 2000
PANEL 54 OF 81, MAP # 06059C0054 F, JUN 14, 2000
PANEL 47 OF 81, MAP # 06059C0047 E, SEPT. 15, 1989
PANEL 55 OF 81, MAP # 06059C0055 F, SEPT. 15, 1989

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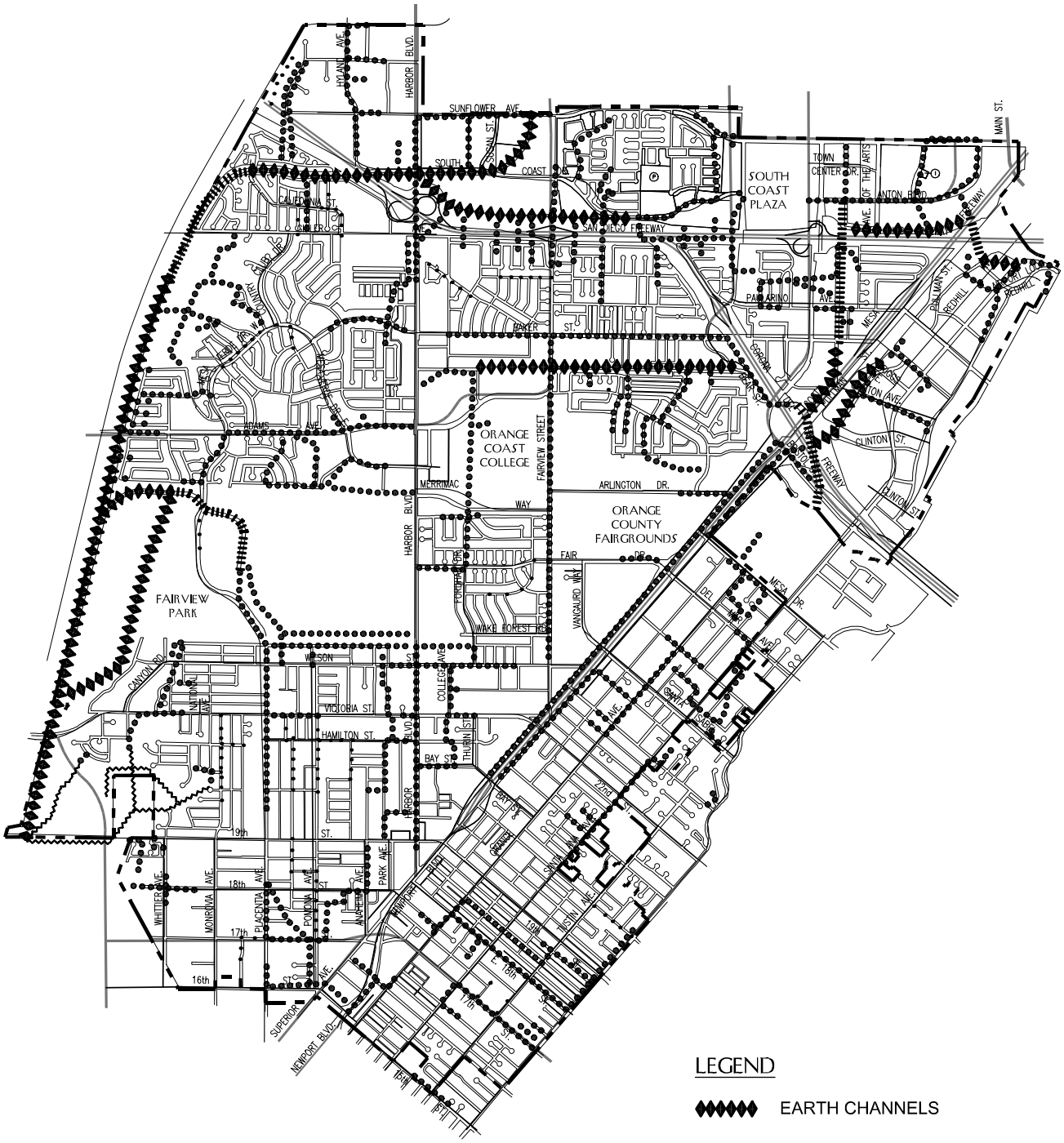
EXHIBIT SAF-6

MASTER PLAN OF DRAINAGE



SCALE: 1"=4500' Source: City of Costa Mesa Master Drainage Plan, December 1997

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EXHIBIT SAF-7

1969, and is updated periodically. This plan delineates numerous specific projects to improve Costa Mesa's storm drain system. Continued implementation of this plan and the construction of the remaining improvements should provide the City with appropriate control over local drainage concerns.

FIRE PROTECTION

The City of Costa Mesa Fire Department is responsible for fire prevention, enforcement of fire protection laws and ordinances, fire suppression, emergency medical services, hazardous materials response and weed abatement. These services are considered essential and must be continually reviewed and updated in the planning process. Fire protection incorporates all elements of the community, the private sector, the community agencies and the Fire Department. The Fire Department seeks to balance the various elements to better serve community needs through the use of built-in fire protection such as early warning and detection systems, automatic fire sprinklers, fire resistive design of structures and materials, fire prevention inspections and public education.

Modern cities have been successful in attracting and keeping business and industry by maintaining low, base fire insurance rates. These rates are set by ISO Commercial Risk Services, Inc., and are on a scale of one to ten with protection class one affording the best rates. Ratings are based essentially on the capability of the Fire Department to deliver needed quantities of water to building fires in a timely fashion. Factors considered in the rating include: required fire flow for buildings; available water supplies; fire station locations; fire equipment and personnel; fire inspection programs; firefighter training programs; and fire communications systems.

Costa Mesa has achieved and maintains a protection class two, which affords residents and business owners excellent base fire insurance rates. In order to maintain this high rating, the City must maintain a high level of fire protection and prevention as building densities increase and vacant land is developed. This is accomplished by continual monitoring of existing conditions, review of all building projects and planning for additional fire protection facilities, equipment, personnel and training to meet future needs.

FIRE STATION LOCATIONS

The factors affecting the location of fire stations in the City include: economics; major fire potential; high life hazards; historical significance; response distances; street patterns; traffic volumes; and required fire flow. The six existing fire station locations within Costa Mesa are shown on Exhibit SAF-8, *Public Facilities*. A seventh station is preliminarily planned near Harbor Boulevard and South Coast Drive.

WATER SUPPLY

In general, the required fire flow is closely related to land use. The quantity of water necessary for fire protection varies with the type of development, life hazard, occupancy, and the degree of fire hazard. Fire flow requirements vary from 1,500 gallons per minute (GPM) in low density residential areas up to 5,500 gpm in commercial, industrial and high density residential areas.

PUBLIC FACILITIES

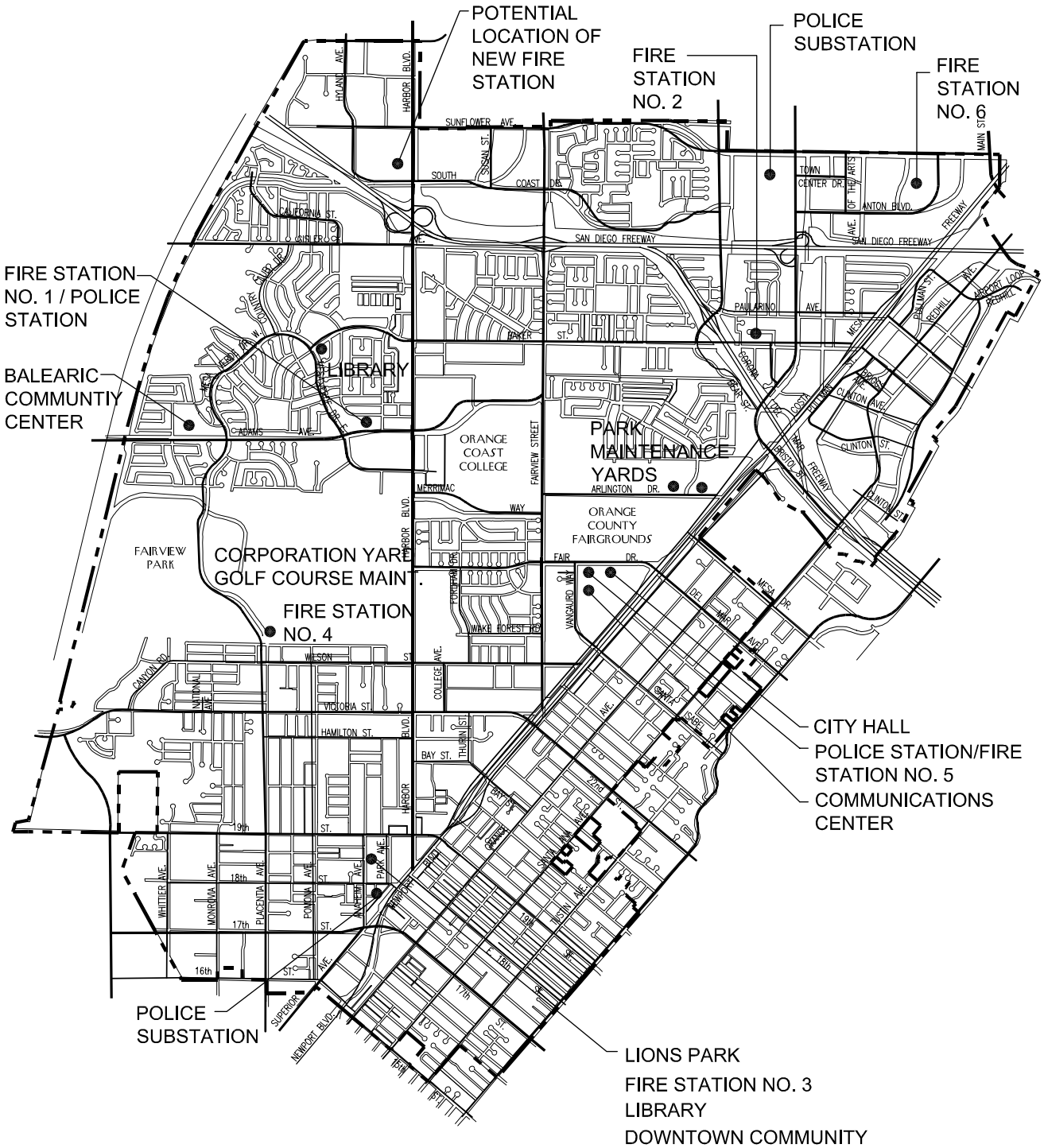

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EXHIBIT SAF-8

FIRE PREVENTION

Fire prevention activities include engineering research, enforcement of State laws and City ordinances, and public education to minimize avoidable fires. All businesses in the City are inspected at least annually for conformance with fire prevention laws and ordinances and elimination of fire hazards. Public education includes training programs for all age groups, industries, and institutions by staff members and fire suppression members so that the public will be fire prevention conscious.

FIRE SUPPRESSION

Since not all fires can be prevented, maintaining a well trained, capable and well equipped fire fighting force is essential. Quick containment and suppression are key considerations, therefore, response time is critical. Every effort is made to avoid excessive response times. Some of the key factors in reducing response times include maintaining the highest quality emergency communications system to ensure as little delay as possible between the receipt of an alarm and the dispatch of the closest and most appropriate fire apparatus. A goal of the Fire Department is to respond to fire and emergency medical emergencies within five minutes 80 percent of the time. Automatic and mutual aid agreements throughout the County assure assistance for major incident resource needs and closest unit response service.

Another method of reducing response times is to ensure that all developments are provided with appropriate identification in terms of addresses visible from the street and appropriate fire apparatus access. Access considerations include width of roadways, vertical clearance, adequate turning radii, appropriate turnarounds and lack of obstructions.

EMERGENCY MEDICAL SERVICES

Emergency medical services are also provided by the Fire Department. Specially equipped fire apparatus provide advanced life support (paramedic) level service with State licensed paramedics. All other nonparamedic fire personnel are trained at the basic life support (emergency medical technician) level. The program strives to meet the goal of responding to 80 percent of requests for emergency medical care within five minutes.

HAZARDOUS MATERIALS INCIDENTS

Incidents involving hazardous materials have the potential of being very costly to the City in terms of risk, liability and potential of loss of life and property. All firefighters are trained to the hazardous materials first responder level, but the City does not have the capability to handle incidents of a major nature. Rather, the City contracts with the Orange County - City Hazardous Materials Emergency Response Authority for response to major hazardous materials emergencies.

POLICE PROTECTION

The City of Costa Mesa Police Department is responsible for maintaining the social order within prescribed ethical and constitutional restrictions through the enforcement of local, State and Federal laws. The completion of this mission involves: crime prevention, field patrol (ground and air), crime investigation, apprehension of offenders, traffic enforcement and control, regulation of non-criminal activity, and the performance of a number of related and support services.

The Police Department is comprised of 228 full-time personnel, of which 154 are sworn police officers and 74 are civilian support personnel. In addition, there are 55 part-time personnel and approximately 35 Police Senior Volunteers that augment Department personnel. Based upon 1999 population estimates by the California State Department of Finance, Costa Mesa has a total population of 105,608, which reflects a ratio of 1 police officer per 685 persons.

To support the required personnel and equipment, the Police Department maintains a primary Police Facility located on Fair Drive in the Civic Center complex. The Police Facility was constructed in 1967, and is inadequate to support current personnel and equipment requirements. The Department also maintains three substations: one located in the South Coast Plaza complex, the Westside Sub-station located at 567 West 18th Street, and a small office in Fire Station No. #3 located 2803 Royal Palm. An elevated heliport is located at the Police Facility in the Civic Center complex from which the Department operates three helicopters in conjunction with A.B.L.E. (Airborne Law Enforcement), a joint powers authority with the cities of Costa Mesa and Newport Beach to provide law enforcement helicopter patrol and related services.

EMERGENCY RESPSONSE AND OPERATIONS

The Costa Mesa Disaster Plan serves as the community's Emergency Operations Plan (EOP), which provides guidance during emergency situations associated with natural disasters, technological incidents, and nuclear defense operations. The Plan does not address normal day-to-day emergencies or the well-established and routine procedures used in coping with such emergencies. Rather, the EOP analyzes potential large scale disasters that require a coordinated and immediate response.

Aid during these unique emergency situations is available within the local government structure and associated agencies. The EOP identifies key personnel and groups in the Costa Mesa Emergency Management Organization that are organized to protect life and property in the community. The Disaster Plan also identifies sources of outside support that might be provided through mutual aid by other jurisdictions, state and federal agencies, and the private sector. In addition, the Disaster Plan specifies operations during an emergency, organization and assignment of responsibilities, coordinating instructions, an explanation of how the plan is to be administered, procedures to identify responsible personnel, and methods to request aid/support from other local communities. These activities involve a number of agencies, including the police department, fire department, medical facilities, public health officials, coroner and care and shelter operations. The City's emergency evacuation routes are shown on Exhibit SAF-9, *Emergency Evacuation Routes*.

The Evacuation Coordinator, who is the Police Chief, coordinates all emergency evacuation activities. The Police Chief will issue evacuation orders based on information gathered from emergency experts. Evacuation operations will be conducted by law enforcement agencies, highway/road/street departments, and public and private transportation providers.

EMERGENCY EVACUATION ROUTES

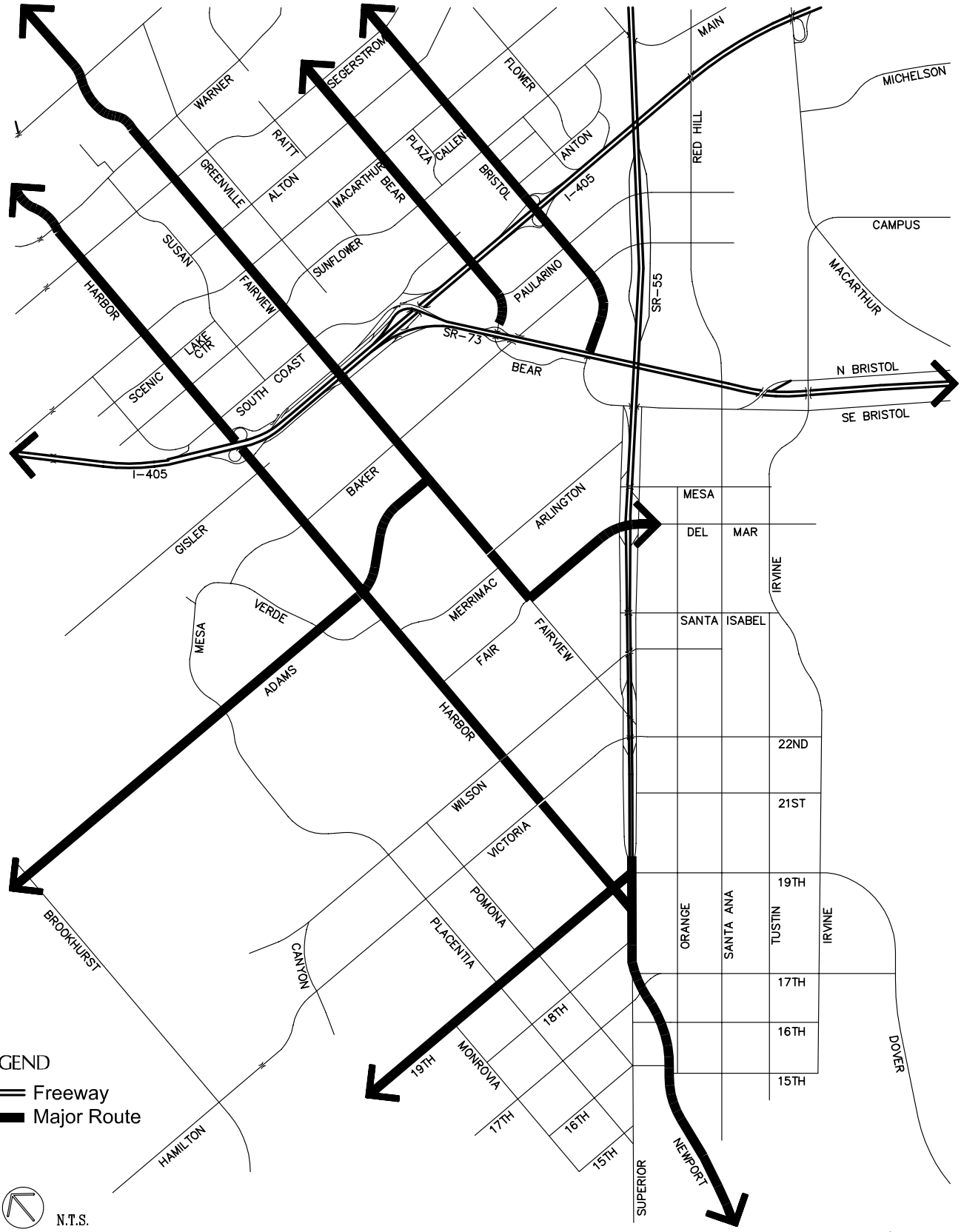

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EXHIBIT SAF-9

HAZARDOUS MATERIALS

HAZARDOUS WASTE MANAGEMENT

In response to the growing Statewide concern of hazardous waste management, State Assembly Bill 2948 (Tanner 1986) enacted legislation authorizing local governments to develop comprehensive hazardous waste management plans. The intent of each plan is to assure that adequate treatment and disposal capacity is available to manage the hazardous wastes generated within its jurisdiction. In 1987, the Orange County Board of Supervisors authorized the preparation of the Orange County Hazardous Waste Management Plan. The final plan was adopted in January 1989 and subsequently amended in 1991. The City of Costa Mesa subsequently approved the County Plan in 1989 and the amendment in 1991. The State Department of Health Services approved the County's Plan in late 1991.

ORANGE COUNTY HAZARDOUS WASTE MANAGEMENT PLAN

The Orange County Hazardous Waste Management Plan provides policy direction and action programs to address current and future hazardous waste management issues that require local responsibility and involvement in Orange County. In addition, the Plan discusses hazardous waste issues, and analyzes current and future hazardous waste generation in the County.

The purpose of the Authority is to coordinate local implementation of a regional action program to effect comprehensive hazardous waste management throughout Southern California. The action program focuses on the development of programs to equitably site needed hazardous waste management facilities; to promote on-site resource reduction, treatment and recycling; and to provide for the collection and treatment needs of small quantity hazardous waste generators.

An important component of the County Hazardous Waste Management Plan will be the monitoring of hazardous waste management facilities to ensure compliance with Federal and State hazardous waste regulations. The siting criteria and any subsequent environmental documentation required pursuant to CEQA will also ensure the mitigation of adverse impacts associated with the siting of any new hazardous waste facility.

COSTA MESA HOUSEHOLD HAZARDOUS WASTE ELEMENT

In April 1992, Costa Mesa prepared and adopted a Household Hazardous Waste Element (HHW). This Element is consistent with the County of Orange Hazardous Waste Management Plan. The HHW supports the countywide strategy to collect and dispose of household hazardous waste from the community. The City does not incorporate an independent collection and disposal program as part of the HHW Element. The City will continue to support the County of Orange's program through public education efforts.

HOUSEHOLD HAZARDOUS WASTE PROGRAM

The County of Orange selected permanent Household Hazardous Waste collection facilities as the most appropriate method for managing this waste category. Currently, there are four Household Hazardous Waste Collection Centers that serve the county. These facilities are located in Anaheim, Huntington Beach, Irvine and San Juan Capistrano.

The City of Costa Mesa supports the County's Household Hazardous Waste Program and will monitor participation of City households. If participation rates are low, the City will intensify efforts to increase public awareness and participation.

8.4 KEY ISSUES

GEOLOGY

Geologic and seismic hazards are constraints to development. Costa Mesa, like much of the region, is likely to experience a powerful earthquake. Ground failure hazards for the northwest and western portions of the City, due to their location within an area with the potential for liquefaction, settlement or ground lurching or ground cracking during severe groundshaking, should be reduced if possible.

The standards for development should be carefully regulated to minimize structural damage and loss of life, given that a fault zone runs through and adjacent to the City.

FIRE PROTECTION

Additional development in the City will place new demands on the City of Costa Mesa Fire Department, which may result in the need for a new fire station to be constructed within the northwest portion of the City. The factors that contribute to the increased risk of fire hazard (i.e., lack of automatic sprinkler or alarm systems, inadequate peak load water supply, extended response times and inadequate building standards) should be reduced to protect Costa Mesa residents, businesses and structures from fire damage.

POLICE PROTECTION

Additional growth within the City may require additional police services that will be dependent upon several variables: (1) overall population; (2) daytime population; (3) type and location of development; and 4) type, location, and number of dwelling units. Depending upon the composition of these variables, it is estimated that continued growth will require additional police services. These services may require additional personnel, equipment, and/or facilities in varying degrees. The additional personnel may be sworn police officer positions, civilian support positions, or a combination of both. The police services requirements will be evaluated annually by the Police Department.

HAZARDOUS MATERIALS

Hazardous materials and wastes generated within Costa Mesa and transported through the City are safety hazards. A number of businesses utilize or store hazardous materials in the City of Costa Mesa. The accidental release or combustion of these hazardous materials could endanger individuals within the community.

The residents and employees in the City of Costa Mesa should be protected to the greatest extent possible from the effects of transporting, storing and disposing of hazardous and flammable materials. The transportation of hazardous waste poses special problems. Accidents involving hazardous waste

would most likely occur on the I-405 and SR-55 freeways, as well as on the City's major arterials.

8.5 DESCRIPTION OF SAFETY PLAN

Throughout this Element, natural and man-made hazards have been discussed. The various exhibits illustrate the areas of the City impacted by natural and man-made hazards. In order to maintain a high quality of life, existing and future residents must be protected from natural hazards, such as geologic and seismic activities or flooding, as well as man-made hazards, such as hazardous materials. Only when these hazards are reduced and mitigated can the citizens of Costa Mesa be assured of a safe future.

The goals, objectives and policies contained in the following section provide direction for the City as to how the natural and man-made hazards must be reduced to achieve the highest amount of public safety possible at buildout of the community.

8.6 GOALS, OBJECTIVES AND POLICIES

The goals, objectives and policies that address safety concerns are as follows:

GOAL SAF1:
ENVIRONMENTAL AND MANMADE HAZARD PROTECTION

It is the goal of the City of Costa Mesa to protect its citizens and property from injury, damage, or destruction from environmental hazards, including hydrologic, geologic, and climatic episodes, as well as from man-made hazards, including hazardous materials.

Objective SAF-1A: Work towards the mitigation or prevention of potential adverse consequences of natural disasters.

SAF-1A.1 Consider geologic hazard constraints, impacts, and mitigation when developing land use policies and when making public decisions relating to land development.

SAF-1A.2 Enforce standards, review criteria, and other methods to ensure that structures on or adjacent to bluffs are set back sufficiently to preserve the natural contour and aesthetic value of the bluff line and to provide sufficient access for fire protection.

SAF-1A.3 Require geologic surveys of all new development located on or adjacent to bluffs.

SAF-1A.4 Cooperate with local, State, and Federal flood control agencies to reduce the potential for flood damage in the City of Costa Mesa.

SAF-1A.5 Identify and publicize the extent of geologic and seismic hazards within Costa Mesa and advise affected residents and property owners of appropriate protection measures. Offer information regarding earthquake standards to reduce or eliminate structural damage.

SAF-1A.6 Encourage, through technical assistance or development incentives, private property owners to take adequate steps to protect their property against seismic hazards.

SAF-1A.7 Require all proposed development projects to be designed to minimize both the volume and velocity of surface runoff and permit no adverse downstream impacts due to increased runoff through the proper design of subsurface drains, appropriate grading, on-site retention basins, landscape programs, or other appropriate measures.

SAF-1A.8 Publicize the extent of flood hazards within Costa Mesa and advise affected residents and property owners of appropriate protection measures. Develop an education program, such as the Flood Awareness Program, and emergency disaster plans for flooding.

SAF-1A.9 Encourage County, State, and Federal agencies to complete flood control improvements to the Greenville-Banning Channel to protect Costa Mesa residents and property located in the 100-year flood zone from a potential major disaster.

Objective SAF-1B: Participate in the safe, efficient and responsible management of hazardous waste materials.

SAF-1B.1 Participate with the County of Orange in the implementation of the Orange County Hazardous Waste Management Plan.

SAF-1B.2 Ensure that appropriate in-depth environmental analyses are conducted for any proposed hazardous waste materials treatment, transfer, and/or disposal facility.

SAF-1B.3 Continue to work with the County of Orange to identify and inventory all users of hazardous materials and all hazardous waste generators and prepare clean-up action plans for identified disposal sites.

Fire and Police Services: Refer to Goal LU-3, Socio-Economic Considerations, Objective LU-3A.3 and LU-3A.4 found in the Land Use Element.

Public Safety Through Design: Refer to Goal CD-14, Public Safety Through Design, Objective CD-14, and Policies CD-14.1 through CD-14.3 found in the Community Design Element.